

## **UNCRATING/INSTALLATION INSTRUCTIONS**

**Basil® 4600 Cage and Rack Washer**

**Basil® 4602 Cage and Rack Washer**

(2004-02-13)

P910000-015

# A WORD FROM STERIS CORPORATION

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Follow each step of these *Uncrating/Installation Instructions* **in the order presented**. To avoid damage to the equipment inside, open the carton *carefully*. If you find any indication of damage to the equipment (no matter how slight), show it to your supervisor.

To properly install this unit, you will need the Equipment Drawings provided, showing all utility service and space requirements. If drawings cannot be located, replacement copies may be obtained by writing, faxing, or telephoning STERIS, giving the serial number and model of your unit.

Once installed, unit operation should be tested by a STERIS-trained service technician prior to your equipment usage.

If STERIS supervision is desired for installing and starting up this equipment, contact STERIS for pricing and availability of this service in your region.

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## Advisory

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**IMPORTANT:** This unit is specifically designed to only process goods as outlined in *Operator Manual* (P122997-341).

A listing of the *Safety Precautions* to be observed when uncrating, installing, and testing this equipment can be found in Section 1 of this manual. Do not begin uncrating/installing the equipment until you have become familiar with this information.

Any alteration of this equipment not authorized or performed by STERIS which could affect equipment operation will void the warranty, could adversely affect cleaning efficacy, could violate national, state, and local regulations, and could jeopardize your insurance coverage.

To assure operators are adequately trained in the safe use of the equipment, STERIS recommends that:

- all personnel who operate or maintain the equipment are trained in its operation and in its safe use;
- personnel working with toxic chemicals and vapors (if applicable) have comprehensive instructions in the unit, process, relevant health hazards, and methods to detect the escape of toxic materials;
- there is regular training of all personnel concerned with the operation and maintenance of the equipment; attendance records are maintained; and the evidence of understanding is demonstrated.

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## Indications for Use

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The Basil® 4600 Cage and Rack Washer and Basil® 4602 Cage and Rack Washer are heavy duty, large capacity hydrospray washers designed for thorough, efficient cleaning of cages, racks, debris pans and miscellaneous items used in the care of laboratory animals.

These units are specifically designed to only process goods as outlined in the Operator Manual. If there is any doubt about a specific material or product, contact the manufacturer of the product for the recommended washing technique.

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## Service Information

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A thorough preventive maintenance program is essential to safe and proper unit operation. You are encouraged to contact STERIS concerning our comprehensive Annual Maintenance Agreements. Under the terms of these agreements, preventive maintenance, adjustments, and replacement of worn parts are done on a scheduled basis to help assure equipment performance at peak capability and to help avoid untimely or costly interruptions. STERIS maintains a global staff of well equipped, factory-trained technicians to provide this service, as well as expert repair services. Please contact STERIS for details.

**For contact information, see inside back cover.**

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## Certification

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The **Basil 4600 Cage and Rack Washer** and **Basil 4602 Cage and Rack Washer** meet the applicable requirements of the following standards:

- **Underwriters Laboratories (UL)** Standard 1262, as certified by ITS Testing Laboratories, Inc.

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# LISTING OF SAFETY PRECAUTIONS








1

The following listing of *Safety Precautions* **must** be observed when installing this equipment. WARNINGS indicate the potential for danger to personnel, and CAUTIONS indicate the potential for damage to equipment. These *Safety Precautions* are repeated, where applicable, throughout the manual.

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## WARNING – PERSONAL INJURY HAZARD:

-  When handling cabinet panels, use extreme care and wear protective gloves. Panels are heavy and may have sharp edges.
-  When positioning cabinet panels two people are required to lift and support each panel because of weight and size. One person must support panel while the other person installs the nuts and bolts.
-  Before placing any weight on the roof panel, secure panel on top of cabinet by installing bolts and nuts, finger tight, in all four corners of roof panel.
-  When installing doors, more than one person is required to lift doors because of weight and size.
-  When installing control column(s), more than one person is required to lift control column in place because of weight and size.
-  When installing detergent tank, more than one person is required to lift tank because of weight and size.
-  When moving sump coil, more than one person is required to lift coil because of weight and size.



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## CAUTION – POSSIBLE EQUIPMENT DAMAGE:

-  When checking rotation of drive motor, use extreme caution. If rotation is incorrect, carriage will run directly into the door header.
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## Definition of Symbols

Symbol	Definition
	Protective Earth (Ground)
	Warning! Risk of Electrical Shock

*NOTE: Please review these instructions carefully prior to installing equipment. Follow instructions in the sequence given.*

1. Review installation site and room layout drawings provided with Installation Kit. It may be necessary to vary the actual installation from the drawings due to space limitations or existing obstructions.
2. If necessary, unload, uncrate and move equipment to installation site. Refer to *Uncrating / Utility Connection Instructions* (P910000-016) shipped with unit.
3. If handling disposal of debris, ensure customer signs off on the disposition of trash left on the job site.
4. Check the Occupational Health and Safety Act as well as local electrical and plumbing codes for any special requirements that may pertain to the installation of this equipment.
5. Recommend to customer that shutoff valves be installed at readily accessible locations in steam and water supply lines near the equipment.
6. Recommend to customer that disconnect switch (with OFF position lockout only) be installed in electric supply line within 10 feet of the equipment.

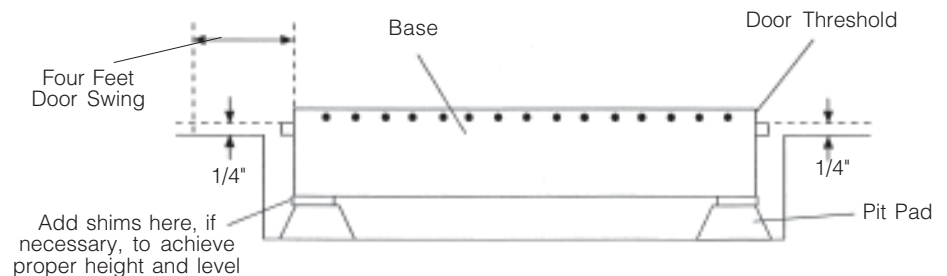
*NOTE: If washer is installed next to other equipment, shutoff valves and disconnect switch must be placed so that service can be shut off to any one piece of equipment at a time.*

## 3.1 General Guidelines

1. All mounting hardware necessary for complete installation is shipped with the unit. Not every piece of mounting hardware will be utilized; ample amounts are provided.
2. If necessary, use 6" X 6" X 1/8" thick stainless-steel shims to level equipment. Do not exceed 3/4-inch shim height. If equipment requires more than 3/4" shimming material, use square tubing to level equipment.
3. Use silicone (RTV) provided in Installation Kit to seal all panel joints to assure watertightness. When caulking, silicone bead should be a minimum of 1/4 inch wide and completely circle all bolt holes. When in doubt, use silicone liberally. It is easier to prevent a leak during assembly than to fix a leak once equipment is in use.
4. All bolts going to atmosphere (from inside of chamber to outside of cabinet) require sealing washers.
5. All bolts require lockwashers, except the welded nuts along the non-service side of the washer.

## 3.2 Base

1. Lift door grating and remove sump coil from base. Replace floor grating in base.
2. Position base according to room layout drawings, either in a pit or on the floor. If pit mounted, make sure face of surface is parallel to pit wall (within two to three inches from the non-service side wall) or positioned as specified in the room layout drawings.
3. Check base height (see Figure 3-1). Ensure the door threshold is at least 1/4" higher than the highest spot on the floor, along the netire door swing (four feet from base). If necessary, position shims under corners of base.

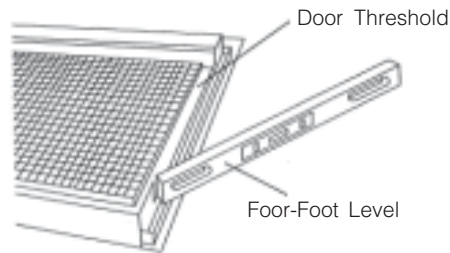


**Figure 3-1. Check Base Height**



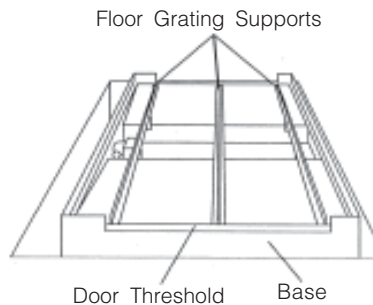
**If pit mounted,** use a four-foot level to check the door swing (see Figure 3-2). Hold one end of level on door threshold and place two 1/8-inch shims under the opposite end. Check door swing at 90°, 45°, and 15°.

**NOTE:** When shimming, ensure shim is placed under corner of base with part of the shim exposed.



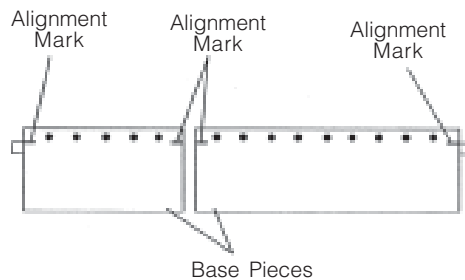
**Figure 3-2. Check Door Swing**

4. Check level of base along face and length. If necessary, position shims under corners of base. If shims are used to level base, base height must be re-checked once the base is level.
5. In some instances, the base may be shipped in two or three pieces. If base is split, assemble base pieces as follow:
  - a. Position base pieces, next to one another, close to the final location indicated on the room layout drawings.
  - b. Connect the base pieces by installing the floor grating supports down the center of the base and on either side of the door threshold (see Figure 3-3).



**Figure 3-3. Install Floor**

- c. Align the base pieces by stretching a string across the four alignment marks located on the side of each piece (see Figure 3-4). If necessary, position shims under corners of base piece(s).

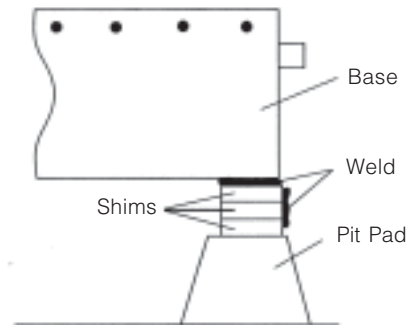


**Figure 3-4. Align Base Pieces**

- d. Check base height and level of base as explained in **Steps 3 and 4**.
- e. Once base is level, spot weld a series of one-inch welds along the base seams to maintain the established position.

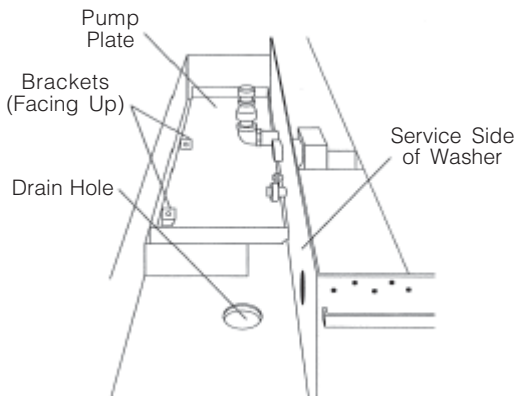
**NOTE:** *The heat generated by most welding operations will damage epoxy/vinyl flooring. Take appropriate precautions to protect floor from heat and welding arc.*

- f. Completely weld all base pieces together from the inside.
  - g. Check for pin holes and incomplete welds. All welds must be water tight.
  - h. Clean up welds using a wire brush.
6. If shims were used, weld shims in place to form a solid foundation (see Figure 3-5).



**Figure 3-5. Weld Shims**

7. Attach pump plate to service side of washer (see Figure 3-6). Ensure brackets are facing up and plate does not cover drain hole.



**Figure 3-6. Install Pump Plate**

8. Check level of pump plate along the plate width and length. If necessary, position shims under the brackets attached to pump plate. Silicone shims in place, using a heavy bead of silicone between the shims, between the pump plate and shims and between the shims and floor.

**If pit mounted,** ensure shims are flush with the pit wall.

9. Re-tap threads on all welded nuts (along the non-service side of the washer) with 5/16"-18 threads/inch tap.

### 3.3 Cabinet



#### WARNING—PERSONAL INJURY HAZARD:

- When handling cabinet panels, use extreme care and wear protective gloves. Panels are heavy and may have sharp edges.
- When positioning cabinet panels, two people are required to lift and support each panel because of weight and size. One person must support the panel while the other installs the nut and bolts.

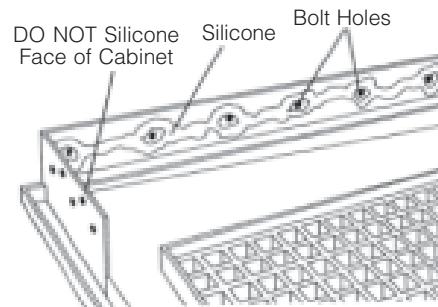
*NOTE: Cabinet must be completely assembled and tightened within the same day, before silicone hardens.*

1. Remove paper from all cabinet panels.
2. Select any corner panel to begin cabinet assembly.
3. Count the number of bolt holes along side of corner panel (e.g. six bolt holes). Do not count bolt holes along face (load/unload side) of corner panel.

*NOTE: When caulking, fully open caulk nozzle to allow for a heavy silicone bead.*

4. On inside of base, silicone around and between the number of bolt holes counted plus one (e.g. seven bolt holes; see Figure 3-7). **Do not silicone along face of unit.** Make sure to silicone in a consistent line.

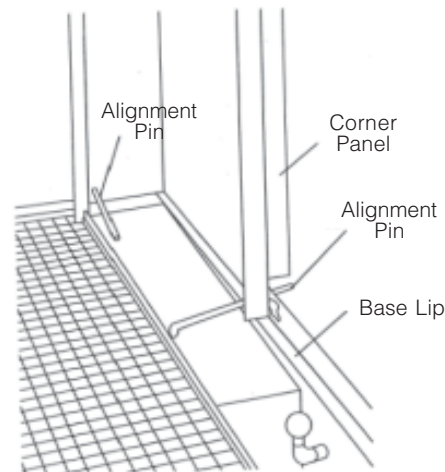
*NOTE: Only silicone around and between the base bolt holes needed to install one panel at a time.*



**Figure 3-7. Silicone Around and Between Bolt Holes**

5. Position bottom of corner panel on base lip. Using your foot, hold bottom of panel on the lip and raise panel up into place. Insert alignment pins, one on either end, to align panel and base bolt holes (see Figure 3-8).

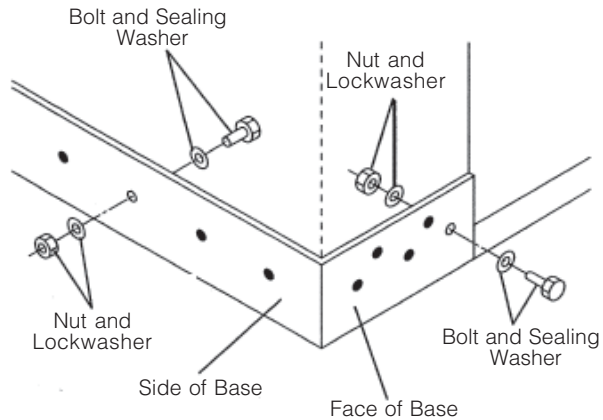
*NOTE: All bolts going to atmosphere (from inside of chamber to outside of cabinet) require sealing washers. All bolts require lockwashers, except the welded nut along the non-service side of the washer.*



**Figure 3-8. Insert Alignment Pins**

6. Attach panel to base. Ensure bolts along face of base are installed with the bolt heads located on outside of base, and bolts along side of base are installed with the bolt heads located on inside of base (see Figure 3-9).

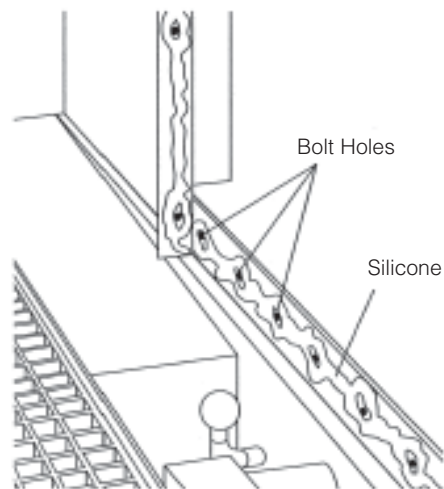
**NOTE:** During panel assembly, all bolts are installed snug (tight enough to flatten the silicone). Once cabinet is completely assembled, bolts will be securely tightened.



**Figure 3-9. Bolt Positions for Corner Panel**

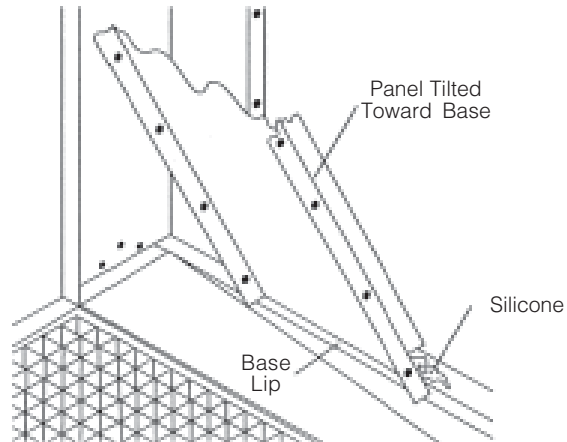
7. Locate next panel to be installed. Each panel is numbered and installed in sequential order, starting with the number assigned to the first corner panel installed.
8. Count the number of bolt holes along bottom of panel.
9. Starting from top of installed panel, silicone around and between bolt holes along the vertical panel joint and along inside of base (see Figure 3-10). When caulking base, ensure to silicone around the number of bolt holes counted plus one.

**NOTE:** Critical Leak areas are at the top and bottom of vertical panel joints, and along base seams if base was split. Use silicone liberally in these areas.



**Figure 3-10. Silicone Vertical Panel Joint and Base**

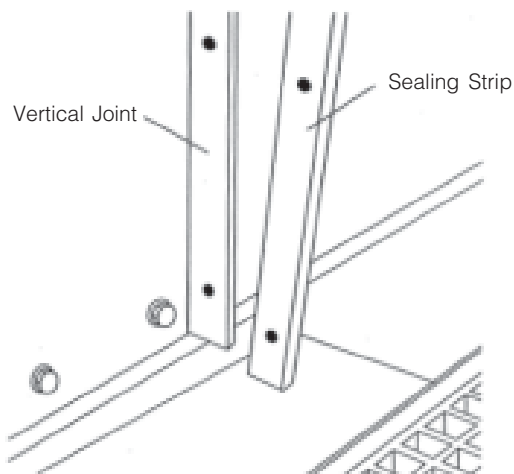
10. Position bottom of panel on base lip, with the panel tilted toward inside of base and two inches away from installed panel (see Figure 3-11). Using your foot, hold bottom of panel on the lip and slide panel over to within 1/2 inch of the installed panel. Raise panel up into place; avoid smearing the silicone. Insert alignment pins through farthest holes, one along horizontal joint and one along vertical joint as high as possible.



**Figure 3-11. Install Side Panel**

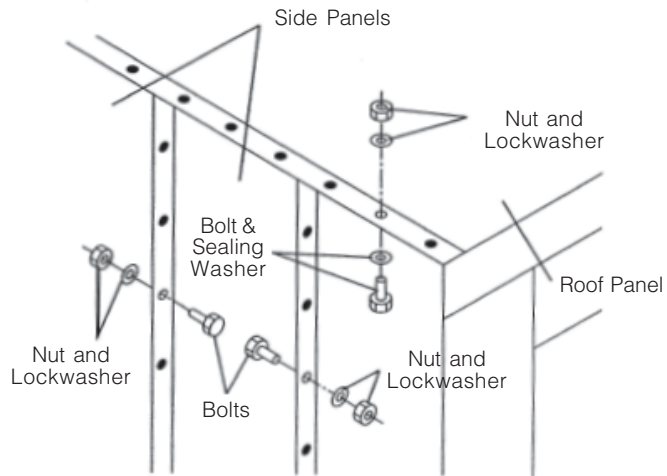
11. Install sealing strip over vertical joint (see Figure 3-12). Ensure numbers on sealing strip match the connecting panels.

**NOTE:** When installing sealing strip, ensure panel is supported while alignment pin is temporarily pulled from the vertical joint.



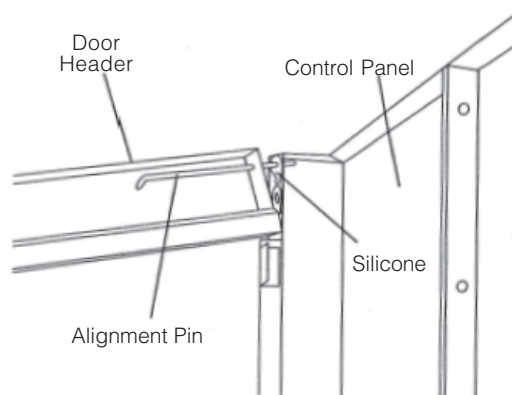
**Figure 3-12. Install Side Panel**

12. Attach panel to base and adjacent panel. Make sure bolts along vertical joint are installed with the bolt heads facing toward center of cabinet (see Figure 3-13).



**Figure 3-13. Bolt Positions for Side and Roof Panels**

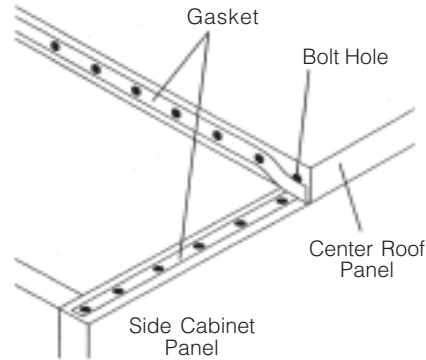
13. Install remaining side and corner panels following **Steps 3 through 12**.
14. Locate door header(s). If pass-through unit, door headers are labelled according to where the header should be mounted (i.e., load or unload end of cabinet).
15. Silicone both ends of door header and the mounting area on each corner panel.
16. Position door header between corner panels using alignment pins to align header and panel bolt holes (see Figure 3-14). Attach door header to corner.



**Figure 3-14. Position Door Header**

17. Verify door header is flush with front (face) of cabinet. Securely tighten bolts attaching door header to corner panels.
18. Along top of cabinet, fill each joint between the connected panels with silicone. Run a continuous line of roof gasket along top of each panel. Center gasket over bolt holes. Silicone between any gasket seams.

19. Working from the top of the cabinet, punch bolt holes through the roof gasket using alignment pin.
20. Install a continuous line of roof gasket along both sides of the center roof panel (see Figure 3-15). Start end of gasket along edge of roof panel, below first bolt hole. Bend gasket up and run gasket over center of the bolt holes. Before last bolt hole, bend gasket down and finish by running gasket along edge of roof panel, below last bolt hole. Using an alignment pin, punch bolt holes through the roof gasket.



**Figure 3-15. Install Gasket on Center Roof Panel**

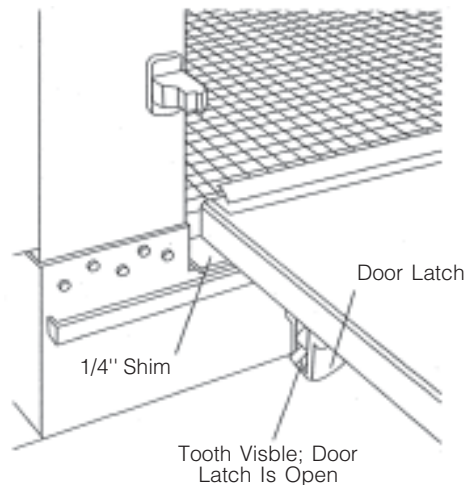


**WARNING—PERSONAL INJURY HAZARD:** Before placing any weight on the roof panel, secure panel on top of cabinet by installing bolts and nuts, finger tight, in all four corners of roof panel.

21. Attach roof panels starting from one end of the cabinet. Panels are labelled indicating which end is attached to the service side of the cabinet. Use alignment pins to align bolt holes and install bolts finger tight. Ensure bolts are installed with the bolt heads located on inside of cabinet (see Figure 3-13).

**NOTE:** When lifting roof panels to top of cabinet, do not slide panels over the roof gasket.

22. Once cabinet is assembled, place a 1/4-inch shim on either side of door opening.
23. Locate chamber door(s) and verify door latches are open. When open, tooth is visible; when closed, solid block is visible (see Figure 3-16).

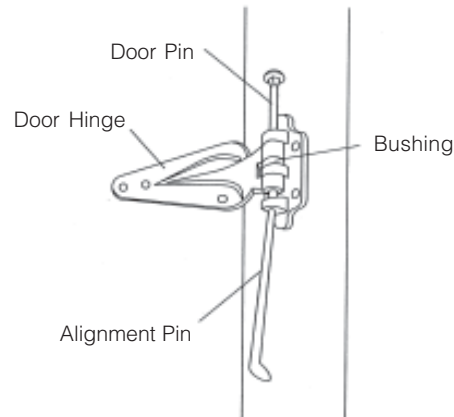


**Figure 3-16. Verify Door Latch is Open**



**WARNING—PERSONAL INJURY HAZARD:** When installing doors, more than one person is required to lift doors because of its weight and size.

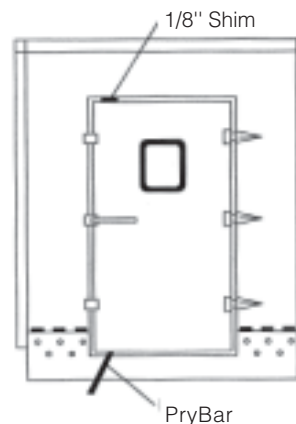
24. Position bottom of door on shims and raise door up into place (see Figure 3-16). Push door closed.
25. For each door hinge, insert alignment pin through hinge (from the bottom) to align door and cabinet hinges (see Figure 3-17). Place four-inch door pin in top of hinge.
26. Using an alignment pin, raise hinges enough to insert first bushing (see Figure 3-17). Hammer door pin partially down through first bushing. Insert second bushing and hammer door pin down completely.



**Figure 3-17. Align Door and Cabinet Hinges**

**NOTE:** It may be necessary to hammer bushing in place between door and cabinet hinges.

27. Once all door pins and bushings are installed, open door and check door swing.
28. Verify cabinet is in final position. Verify face of cabinet (load end) is aligned with face of customer wall. If cabinet position must be adjusted, check level of cabinet along face and length of roof after moving cabinet.
29. To prevent chamber door(s) from sagging while tightening the cabinet bolts, place a 1/8-inch shim between door header and the non-hinged side of the door (see Figure 3-18). Using a pry bar between the door threshold and bottom of door, raise non-hinged side of door and tightly pack the opening with shims.

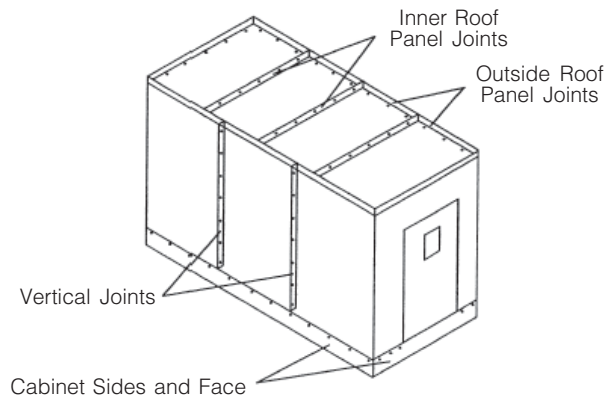


**Figure 3-18. Raise Non-Hinged Side of Chamber Door**



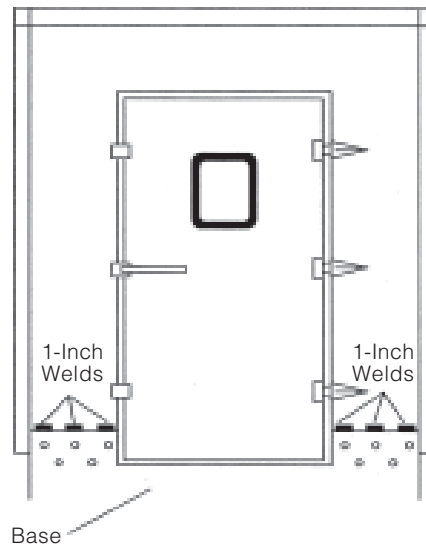
30. Securely tighten cabinet bolts in the order listed below (see Figure 3-19):
- a. Bolts along vertical joints (sealing strips) connecting cabinet side and corner panels together.
  - b. Bolts along cabinet sides and face connecting the base to the cabinet side and corner panels.
  - c. Bolts along inner roof panel joints connecting the roof panels together.
  - d. Bolts along outside of roof panels connecting the roof panels to the cabinet side and corner panels.

**NOTE:** If using an impact gun to tighten bolts, do not use the impact gun on welded nuts located along non-service side of cabinet.



**Figure 3-19. Tighten Cabinet Bolts**

31. Weld base to face of corner panels using three 1-inch welds on both sides of door opening (see Figure 3-20).



**Figure 3-20. Weld Base**

32. Attach high voltage electrical box to service side of cabinet. Open electrical box door and verify that adequate space is available for service access.

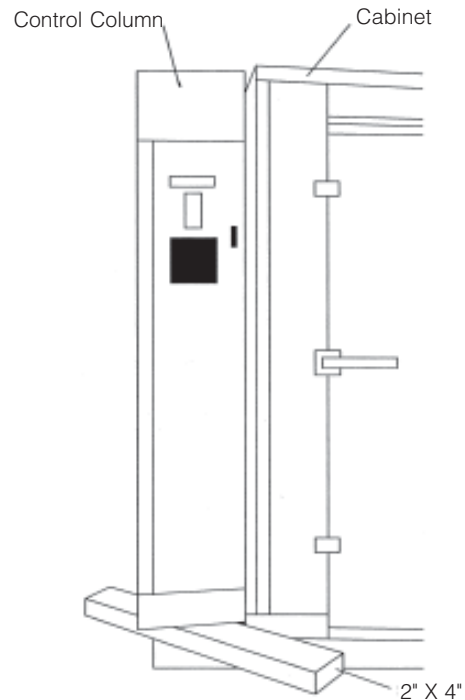


**WARNING—PERSONAL INJURY HAZARD:** When installing control column(s), more than one person is required to lift control column in place because of weight and size.

33. Attach control column(s) to cabinet. Control column, containing printer, is mounted on load end of cabinet. If pass-through unit, additional control column is mounted on unload end of cabinet.

If unit is pit mounted, use a 2 X 4 to balance control column over pit while attaching column to cabinet (see Figure 3-21).

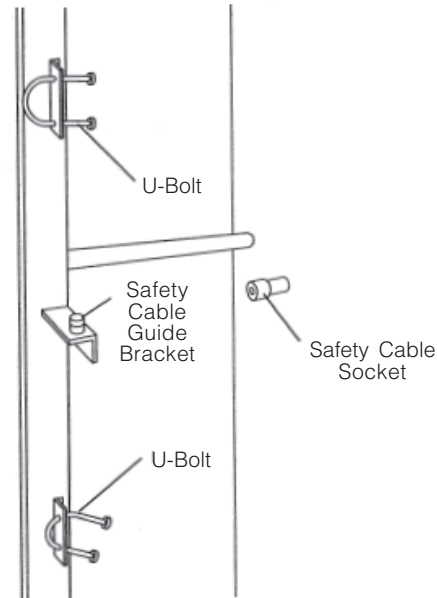
*NOTE: When attaching control column to cabinet, lower door on control column must be opened to access bolt holes.*



**Figure 3-21. Attach Control Column**

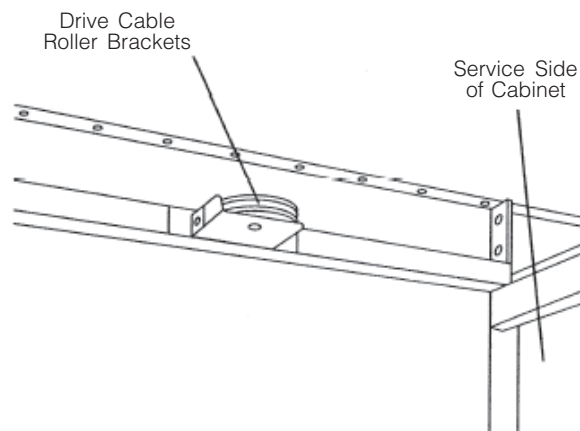
### 3.4 Chamber (Inner Cabinet)

1. Loosely attach U-bolts to cabinet, two on each side of door opening(s) at waist height (see Figure 3-22).



**Figure 3-22. Attach U-Bolts**

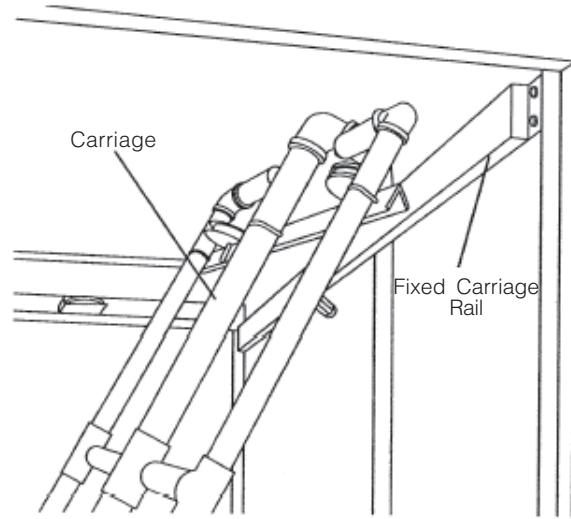
2. Install drive cable roller brackets with roller facing up. Attach two brackets to service side of cabinet exterior, one at each end and two brackets to cabinet interior, one at either end of chamber centered above door opening (see Figure 3-23). Ensure outer brackets are installed with open side facing center of cabinet, and inner brackets are installed with the open side facing service side of cabinet.



**Figure 3-23. Install Drive Cable Roller Brackets**

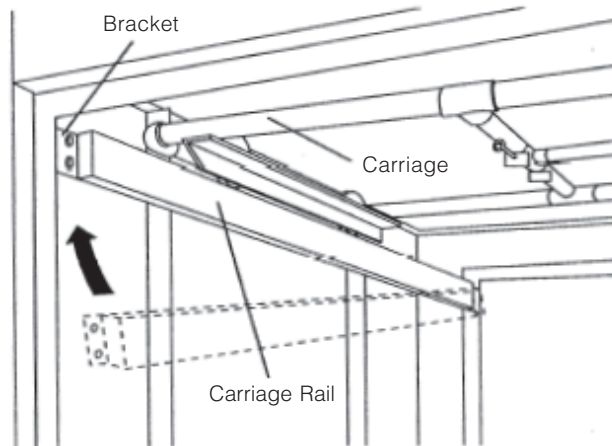
3. Install carriage rails to inside of the brackets located one inch from top of door opening(s), on both sides of the chamber. Completely attach both ends of the first carriage rail, and attach only one end of the second rail. Allow second rail to hang from bracket.

4. Position one side of the carriage on top of the fixed carriage rail (see Figure 3-24). Ensure eye bolts in center of carriage are facing down and the carriage hose connector is located on the same side as the cabinet hose connector.



**Figure 3-24. Position Carriage on Top of Fixed Carriage Rail**

5. While supporting the carriage, raise second carriage rail up into position and attach loose end of rail to inside of bracket (see Figure 3-25). Tighten bolts at both ends of second rail.

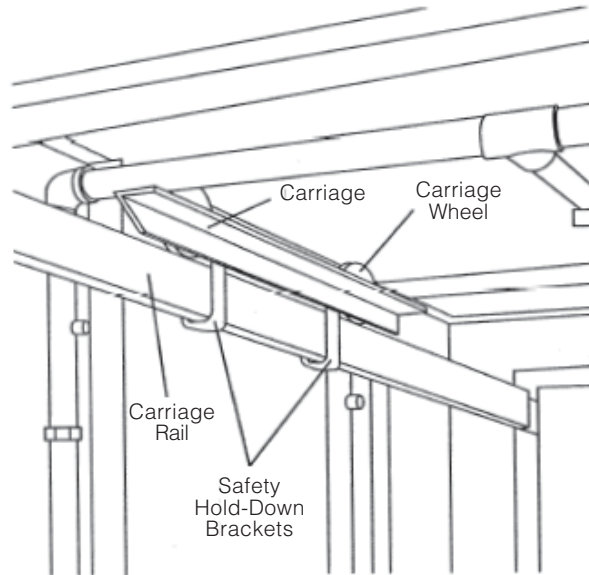


**Figure 3-25. Attach Second Carriage Rail**

6. Verify carriage rides smoothly along the rails.
7. Rotate the spray header connectors, two on either side of carriage, down to 90°. Connect the U-shaped spray headers to the connectors on the carriage.

**NOTE:** *U-shaped spray headers and header connectors are labelled. Connect appropriate spray header to corresponding connectors.*

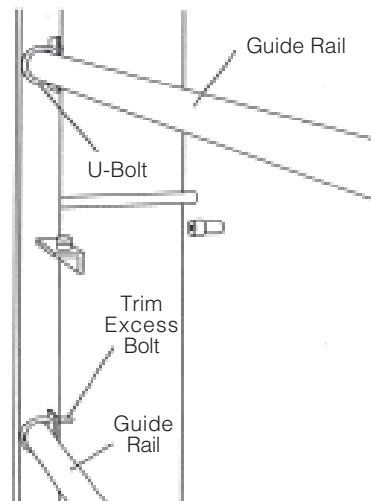
8. Attach safety hold-down brackets (J-brackets) to the carriage, two on each side. Position bracket between the carriage and carriage rail, just inside of the carriage wheel toward the center of the chamber (see Figure 3-26). Mount brackets directly onto the carriage at a 90° angle to the carriage rail.



**Figure 3-26. Attach Safety Hold-Down Brackets**

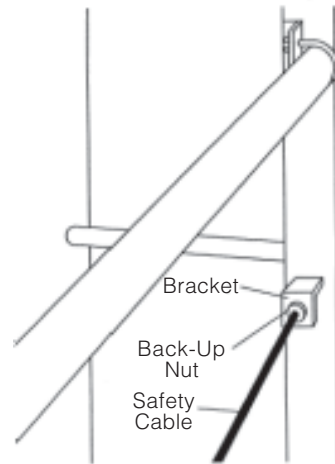
9. Install hose by connecting one end to the carriage hose connector and the other end to the cabinet hose connector, located along bottom center of chamber wall. If necessary, rotate hose (not nipple) to center it in space between chamber wall and U-shaped spray header. Do not allow hose to rub against chamber wall, spray headers, or safety cable.
10. Install two guide rails along each side of chamber. Insert guide rail (one-inch pipe) into U-bolts (see Figure 3-27). Tighten U-bolts and trim excess bolt, leaving 1/2 inch from nut.

**NOTE:** If using vice grips to trim excess bolt, grab bolt 1/2 inch away from nut and bend bolt up and down until excess breaks off.



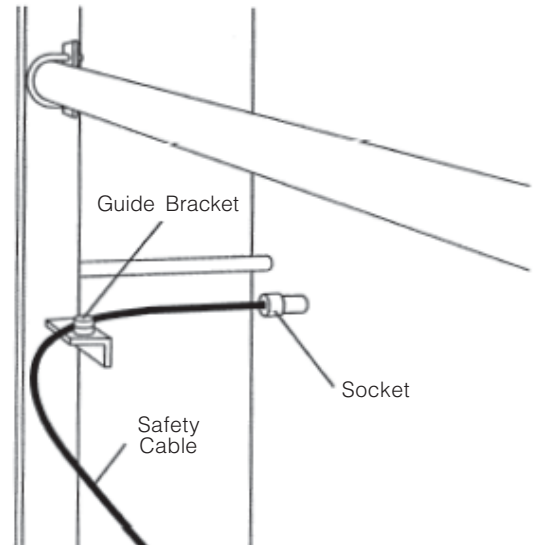
**Figure 3-27. Install Guide Rails**

11. Using a 3/8-inch stainless-steel back-up nut, install safety cable along service side of chamber by attaching bolted end of the cable to bracket located along service side, on opposite end from main control panel (see Figure 3-28).



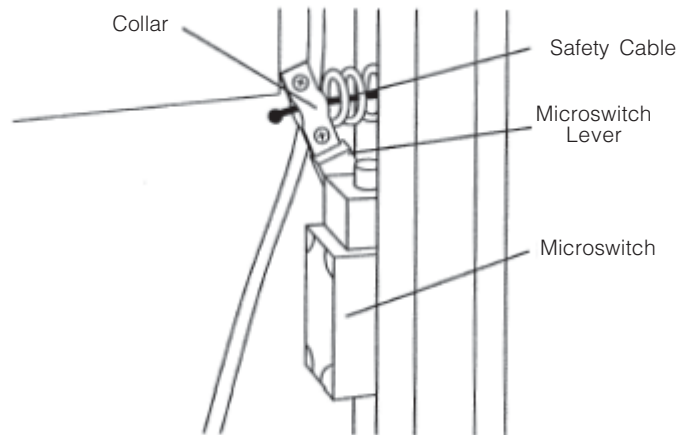
**Figure 3-28. Attach Bolted End of Safety Cable**

12. Feed non-bolted end of the service-side cable through socket into the main control panel (see Figure 3-29). Ensure cable is positioned around guide bracket.



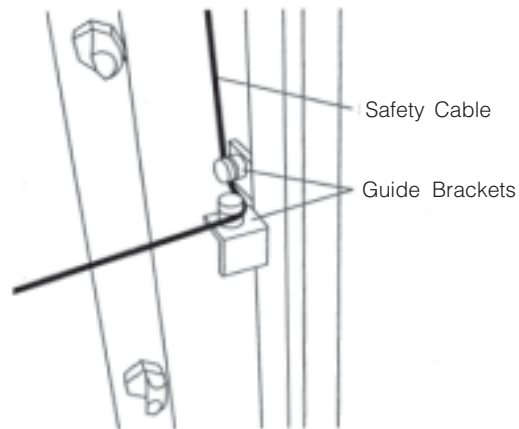
**Figure 3-29. Feed Service-Side Safety Cable Through Socket**

13. Insert end of service-side cable through collar of the microswitch lever, located in main control panel (see Figure 3-30). Tighten collar.



**Figure 3-30. Connect Safety Cable to Microswitch**

14. Using a 3/8-inch satinless-steel back-up nut, install safety cable along non-service side of chamber by attaching bolted end of cable to bracket located along non-service side.
15. Feed non-bolted end of the non-service side cable through socket into the microswitch box mounted on top of the cabinet. Ensure cable is positioned around both guide brackets (see Figure 3-31).



**Figure 3-31. Position Non-Service Side Safety Cable Around Guide Brackets**

16. Insert end of non-service side cable through collar of the microswitch lever, located on top of cabinet. Tighten collar.

17. From inside chamber, pull on each safety cable to verify microswitch engages and connection tight. Verify each microswitch resets after pulling the appropriate cable.

If microswitch fails to reset (microswitch lever does not return to neutral position), loosen retaining bolt connecting the lever to the microswitch. Allow the spindle, inside of the microswitch, to return to the neutral (non-activated) position and retighten the retaining bolt.

***NOTE: There should be a minimum of one to two inches slack in each safety cable. If cable is too tight, heat generated during cycle(s) will expand the cabinet and inadvertently engage the microswitch.***



## 3.5 Service Side of Cabinet

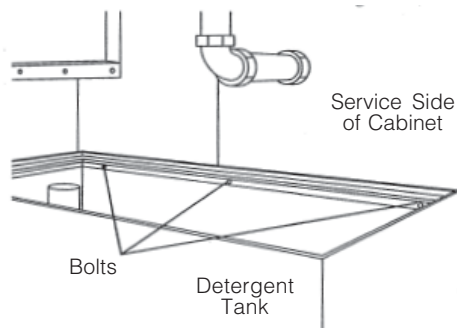


**WARNING—PERSONAL INJURY HAZARD:** When installing detergent tank, more than one person is required to lift tank because of weight and size.

1. Attach tank stand to brackets on pump plate and cabinet exterior. Install bolts finger tight.
2. Ensure electrical door switch wires on both ends of service side (waist height on cabinet exterior) are pushed into sockets.
3. Remove three top plates from detergent tank. Two plates are attached with screws and center plate lifts out.

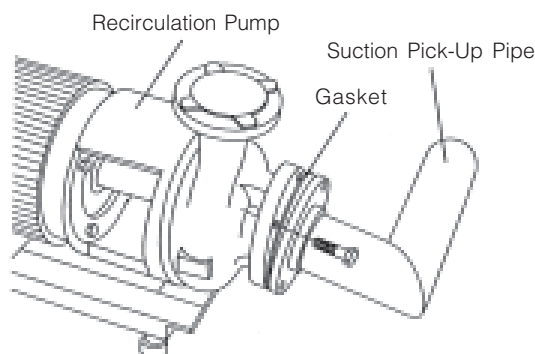
**NOTE:** Center plate is shipped upside down.

4. Position detergent tank on tank stand by rotating and sliding tank up onto the stand. Use care when positioning tank; do not rest piping connections on the stand. Position tank with finished side facing out.
5. Attach top of detergent tank to cabinet by installing three bolts (finger tight) along back of tank (see Figure 3-32). Attach bottom of detergent tank to cabinet and stand (four mounting bolts).



**Figure 3-32. Install Detergent Tank**

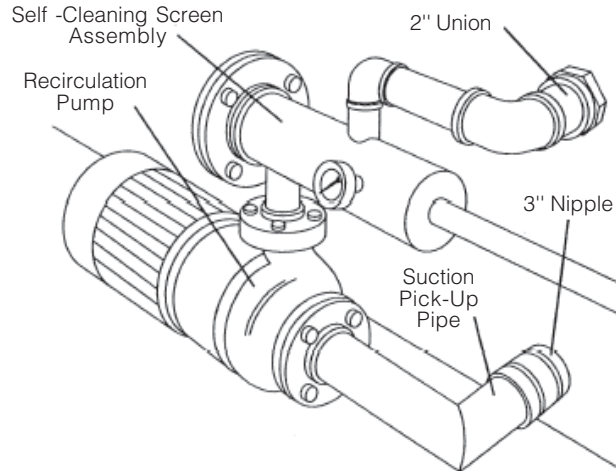
6. Once all mounting bolts are installed on tank and stand, completely tighten bolts.
7. Ensure coil unions, along inside of tank, are tight. Replace tank covers.
8. Place recirculation pump on pump plate with motor fan facing pit wall (opposite load-end of cabinet). Do not bolt pump to pump plate; piping will hold pump in place.
9. Loosely attach suction pick-up pipe (90° elbow) to front of pump with two bolts. Slide gasket between pick-up pipe and pump, and securely fasten pipe to pump (see Figure 3-33). Connect other end of pick-up pipe to three-inch nipple in center of base (see Figure 3-34).



**Figure 3-33. Attach Suction Pick-Up Pipe**

10. Attach the self-cleaning screen assembly to top of recirculation pump with four bolts. Ensure to insert Teflon gasket between self-cleaning screen assembly and pump. Connect other end of screen assembly to two-inch union on side of cabinet (see Figure 3-34).

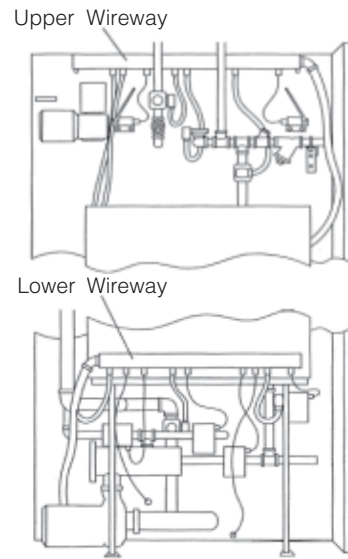
**NOTE:** Each machine is piped differently. There is only one place for each pipe. Follow general guidelines listed in **Step 11** to install piping.



**Figure 3-34. Install Self-Cleaning Screen Assembly**

11. Install all piping using guidelines listed below:
  - a. Prep all male piping connections. Use pipe dope on threads and face of all unions. STERIS recommends use of a liquid Teflon pipe dope, similar to Permalok.
  - b. Attach black pipe to black pipe. Black pipe is used for steam supply and condensate. Condensate pipes normally have a steam trap (thermodisk type) attached on the exit side of the steam coil.
  - c. Attach brass pipe to brass pipe. Brass pipe is use for water supply and alkaline detergent return lines.
  - d. Attach stainless-steel pipe to stainless-steel pipe. Stainless-steel pipe is used for spray header system, drain, and optional acid detergent return lines.
  - e. Attach galvanized pipe to galvanized pipe. Galvanized pipe is used for drain or overflow.
  - f. Install support brackets as required.

12. Attach upper and lower wireways to cabinet (see Figure 3-35). Upper wireway is located near top of cabinet. Lower wireway is located on side of detergent tank.

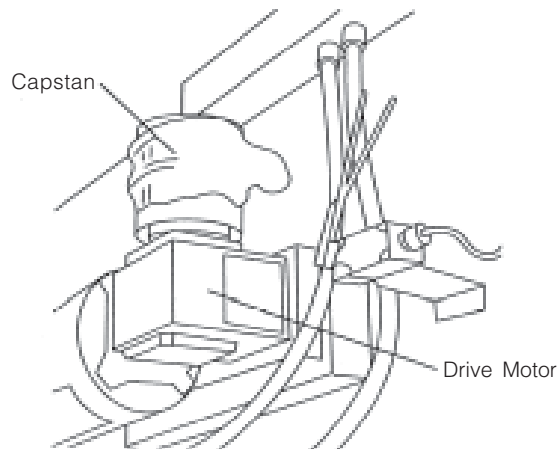


**Figure 3-35. Attach Upper and Lower Wireways**

13. Connect all conduit, switches, and solenoids from wireways to the appropriate locations.

**NOTE:** Each motorized ball valve is equipped with two loose linkage connectors. Ensure connectors do not fall out when installing valves.

14. Attach drive motor with capstan to top left corner of cabinet (see Figure 3-36).



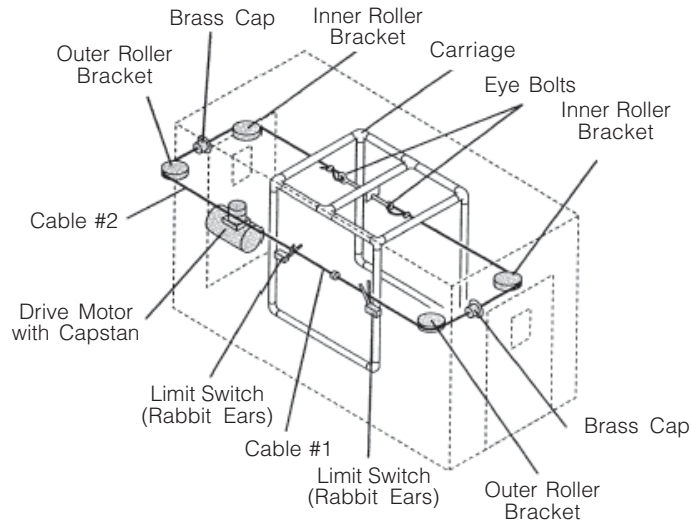
**Figure 3-36. Install Drive Motor with Capstan**

15. Terminate all wires. Match numbers from wireways to corresponding terminals in electrical box or control column.

**NOTE:** Ensure all electrical conduit and cables are clear of hot pipes and moving parts.

16. Remove first layer of tape from drive motor capstan. Unwind cable and feed cable through limit switches (rabbit ears) and outer roller bracket (see Cable #1 in Figure 3-37).
17. Insert cable through opening in cabinet and feed cable through inner roller bracket (see Cable #1 in Figure 3-37).

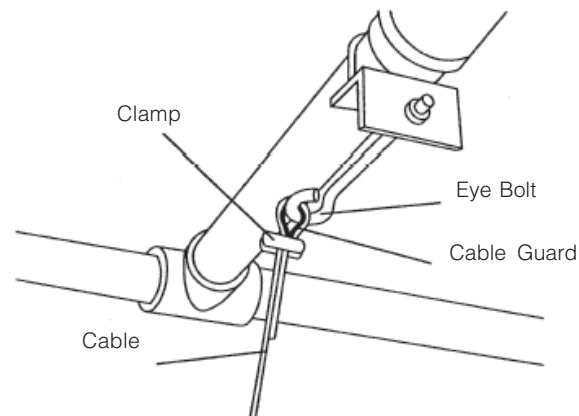
**NOTE:** *It may be necessary to remove brass cap from opening inside the chamber before inserting cable through cabinet.*



**Figure 3-37. Attach Drive Cables to Carriage**

18. Attach cable to eye bolt in center of carriage (see Figures 3-37 and 3-38).

**NOTE:** *Cable may be crimped in correct position from the factory testing. Attach cable to eye bolt in same position.*



**Figure 3-38. Connect Cable to Eye Bolt**

19. Push carriage to opposite end of chamber until the cable is tight.
20. Remove remaining tape from drive motor capstan. Unwind and feed cable through other set of outer and inner roller brackets (see Cable #2 in Figure 3-37). Attach cable to eye bolt in center of carriage (see Figure 3-38).

21. From inside the chamber, pull down on the cable and verify carriage only moves slightly. There should be no slack in the cable and a minimum of one to two inches free play. If necessary, adjust cable tension using the eye bolts. Ensure to adjust eye bolts evenly to maintain a centered carriage.

***NOTE: Do not overtighten cable. Immediate damage or accelerated wear may occur.***

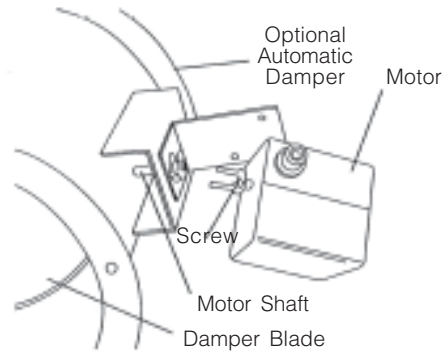
22. Once cable tension is adjusted, remove brass caps from the outer roller bracket openings inside the chamber. Fill each cap with silicone and replace.
23. If applicable, install sight glass on side of detergent tank. Completely install top and bottom fittings. Angle bottom fitting 45° from vertical. Insert sight glass into fittings and rotate bottom fitting into position. Tighten fittings finger tight.

***NOTE: Verify O-rings are situated in fittings before installing sight glass.***

## 3.6 Top of Cabinet

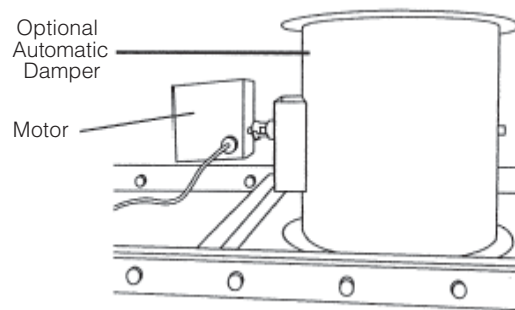
1. If optional automatic damper is provided, install damper as follows:

- a. Verify motor linkage on damper is tight by manually moving the damper blade before installation. Motor shaft should rotate when damper blade is moved. If shaft does not rotate, remove motor and tighten screw on motor linkage (see Figure 3-39).



**Figure 3-39. Tighten Motor Linkage on Optional Automatic Damper**

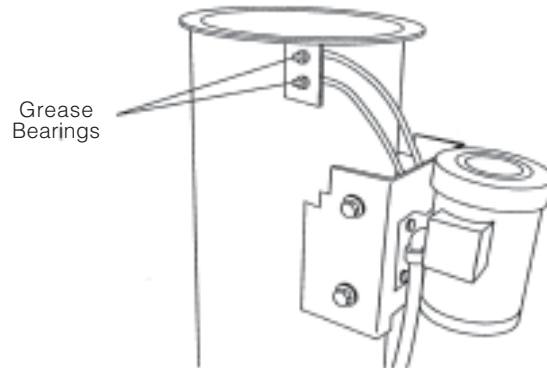
- b. Silicone around and between damper bolt holes. Securely attach damper to top of cabinet with motor (electrical connection down) pointing toward service side of cabinet (see Figure 3-40).



**Figure 3-40. Position Optional Automatic Damper on Top of Cabinet**

- c. Connect damper to appropriate wire(s) on upper wireway.
2. If optional exhaust fan is provided, install fan as follows:
- a. Silicone around and between bolt holes on exhaust fan. Securely attach exhaust fan to top of cabinet with motor pointing toward service side of cabinet.

- b. Attach a remote bracket (supplied by others) and grease fittings to an easily accessible location on the washer exterior. Run a separate copper line from each remote grease fitting to the grease bearings located at top of exhaust fan housing (see Figure 3-41).

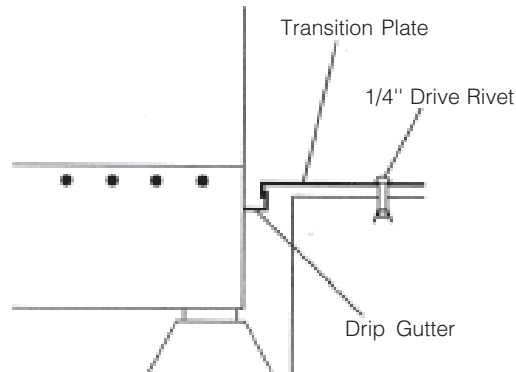


**Figure 3-41. Optional Exhaust Fan Grease Bearings**

- c. Purge both lines with a high temperature, water-resistant grease (P117951-457) up to the bearing connection points. Attach purged lines to the exhaust fan grease bearings.
- d. Connect exhaust fan to appropriate wire(s) on upper wireway.
3. Install insulation on top of entire cabinet, except around the optional automatic damper (if applicable). Insulation must be cut to fit.
4. Install roof covers on top of cabinet by bowing the cover and sliding cover under lip of roof panels.

### 3.7 Final Assembly/ Clean-Up

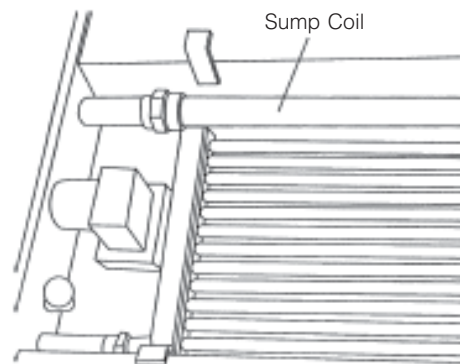
1. If pit-mounted unit, fit edge of transition plate(s) over lip of the drip gutter (see Figure 3-42). Slide transition plate as far away from the unit as the inter-locked surfaces will allow. Secure transition plate to floor with 1/4-inch drive rivets and weld transition plate to drip gutter, maintaining the maximum allowable opening for the drip gutter.



**Figure 3-42. Install Transition Plate**

2. Trim excess silicone and remove any paper or tape from the cabinet interior and exterior.
3. Lift off floor grating and trim any excess silicone around chamber sump.
4. Sweep up all debris from sump and chamber interior.
5. Replace sump coil in chamber sump (see Figure 3-43). Reattach coil to piping connection.

**NOTE:** The 5/16-inch shipping bolt(s), previously removed from opposite side of piping connection, remains off.



**Figure 3-43. Replace Sump Coil**

**NOTE:** Use pipe dope on threads and face of sump coil connection before replacing.

6. Wipe down cabinet exterior with WD-40.
7. If customer is connecting utilities, mark all service connections for customer's convenience.

**WARNING—PERSONAL INJURY HAZARD:** When moving sump coil, more than one person is required to lift coil because of weight and size.



8. Recommend to customer that building exhaust system be all male connections. All washer exhaust connections are female to allow any condensate contained in the building exhaust system to flow into the washer.
9. Recommend to customer that all pressurized drain pipes be centered over the drain hole. All drain holes should be 1-1/2 times larger than the size of the drain pipe.
10. Recommend to customer that sprinkler heads be mounted at least 10 feet away from the unit and be able to withstand temperatures of at least 190°F (88°C).

*NOTE: Installation checklist must be completed after washer is assembled and prior to start-up procedures.*

Complete the following checklist to assure washer is correctly assembled:

- ☐ Control voltage (120 VAC) verified.
- ☐ Pump and motor voltages (3-phase) verified.
- ☐ Optional exhaust fan amperage within rating indicated on fan motor.
- ☐ Optional exhaust fan belt tension correctly adjusted.
- ☐ Grease lines equipped with grease fittings and mounted to washer exterior for convenient maintenance access.
- ☐ Grease lines purged and connected to optional exhaust fan bearings.
- ☐ Recirculation pump amperage within rating indicated on pump motor.
- ☐ Cable tension correctly adjusted.
- ☐ U-shaped spray headers square to washer.
- ☐ Each gear box plastic cap removed and replaced with provided air vent.
- ☐ Spray header connectors tight.
- ☐ Cabinet-to-carriage hose connection located away from cables, spray headers, and cabinet wall.
- ☐ All steam coil unions tightened.
- ☐ All other unions tightened.
- ☐ Chamber door(s) square to washer.
- ☐ Chamber door(s) latch functioning properly.
- ☐ Gray silicone used for exterior cabinet gaps.
- ☐ Excess silicone trimmed off.
- ☐ All sharp edges deburred.
- ☐ Base welded to face of cabinet on both sides of door opening(s).
- ☐ Transition plate(s) welded in correct position.
- ☐ All welds polished.
- ☐ Electrical connections tight.
- ☐ All wires wire tied.
- ☐ 5/16" shipping bolt(s), securing sump coil during transportation, has been removed.
- ☐ Lockable shut-off valves installed in steam and water lines within 10 feet of the equipment.
- ☐ Disconnect switch (with OFF position lockout only) installed in electric supply line in the same q    Washer positioned as shown on the equipment drawing with required service clearance space and in relation to building supply lines.

- ☐ Building steam line provides maximum dynamic pressure and flow rate as specified on the equipment drawing.
- ☐ Drip leg with steam trap installed in steam supply line.
- ☐ Building hot water line supplies water to washer at the pressure and temperature specified on the equipment drawing.
- ☐ If applicable, building cold water line supplies water to washer at the pressure specified on the equipment drawing.
- ☐ Electrical supply for washer is as specified on the equipment drawing.
- ☐ Customer condensate returns are sized as specified on the equipment drawing.
- ☐ Customer vent connections are sized as specified on the equipment drawing.
- ☐ Recirculation pump pressure is within 25 to 60 psig.
- ☐ Recirculation pump motor rotating in direction shown by arrow.
- ☐ Self-cleaning screen assembly functioning properly.
- ☐ Carriage drive motor correctly rotating.
- ☐ Carriage drive system clutch correctly adjusted.
- ☐ Carriage drive motor amperage within rating indicated on the motor.
- ☐ Optional exhaust fan rotating in direction shown by arrow.
- ☐ All piping is leak-free.

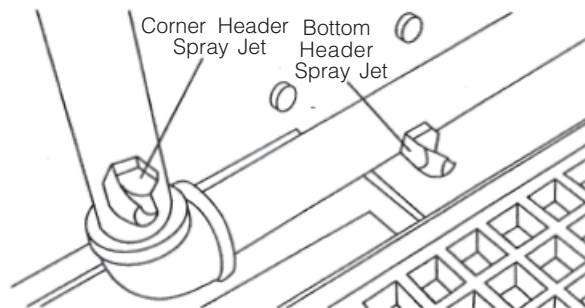
**IMPORTANT:** After a few weeks of operation, inspect unit for leaks. Retighten all clamps and connections.

*NOTE: Start-up procedures are to be performed after utility connections and installation checklist are completed and prior to unit operation by the customer.*

1. Adjust spray jets along top and sides of chamber as follows:
  - a. Using a flat surface (e.g., credit card), determine where each spray jet is directed.
  - b. Roughly position the four carriage spray jets (top of chamber) straight down by rotating the main pipe.
  - c. Roughly position spray jets on both U-shaped headers (both sides of chamber) to direct water straight across from each header.

*NOTE: Jets must be positioned so that spray is 6" away from the door when carriage is at end of the chamber.*

- d. Individually adjust the bottom header spray jets to direct water 45° inward (see Figure 5-1).
    - e. Individually adjust the corner header spray jets to direct water 45° inward (see Figure 5-1).



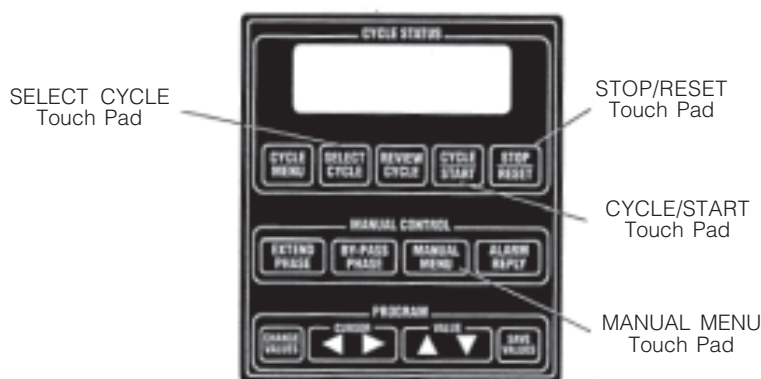
**Figure 5-1. Adjust Header Spray Jets**

- f. Individually adjust the remaining header spray jets to direct water straight out.
      - g. Securely tighten all spray jets. Do not leave spray jets finger tight.
2. Close manual drain valve and turn main disconnect switch on. Ensure control displays time of day when unit is powered up.
3. Check rotation of recirculation pump(s). Bump the motor starter and watch the pump shaft to see if it is rotating in correct direction. If pump shaft is rotating in wrong direction, disconnect main power, reverse any two high voltage wires and recheck pump rotation.
4. If applicable, check rotation of optional exhaust fan. Bump the exhaust fan motor starter. From top of cabinet, light a match and verify the smoke is being drawn into the exhaust fan. If exhaust fan is rotating in wrong direction, disconnect main power, reverse any two high voltage wires and recheck fan rotation.



**CAUTION – POSSIBLE EQUIPMENT DAMAGE:**  
When checking rotation of drive motor, use extreme caution. If rotation is incorrect, carriage will run directly into the door header.

5. Adjust drive system clutch. Remove safety cover from top of the drive motor capstan. Loosen the setscrews on the 3/4-inch adjusting nut located in the center of the capstan. Torque the adjusting nut to 35 ft/lb. When properly adjusted, clutch prevents damage to equipment and load if carriage assembly becomes obstructed.
6. Verify rotation of drive motor and direction of carriage assembly as follows:
  - a. Press **MANUAL MENU** touch pad to access the Manual Control Mode (see Figure 5-2).
  - b. Press **SELECT CYCLE** touch pad to access the Manual Control Mode (see Figure 5-2).
  - c. Press **CYCLE/START** touch pad to initiate the drive motor.



**Figure 5-2. Control Panel**

**NOTE:** Keep your finger on the **STOP/RESET** Touch pad while visually checking the drive motor. It may be necessary to immediately stop the drive function.

- d. As the drive motor is rotating, watch the actuator block located on the cable. Once the actuator block strikes the limit switch (rabbit ears), drive motor should stop and reverse rotation, and carriage assembly should reverse direction.
- e. If the actuator block pulls the limit switch (rabbit ears) past 90°, immediately press **STOP/RESET** touch pad. Disconnect main power and switch any two incoming high voltage wires on the motor starter. Re-check drive motor rotation.

**NOTE:** *DRIVE function is the only manual function that can be operated while the chamber door is open.*

7. Turn on building water supplies and check for piping leaks. Wait for detergent tank to fill and check for tank leaks.
8. Access the manual control mode and individually test each manual function.
  - a. Select **FILL** function and press **CYCLE/START** touch pad. Looking through the door window, check for incoming water flow. Once fill function automatically stops, open chamber door and check that float switch is engaged (sump is full).

- b. Select DRAIN function and press **CYCLE START** touch pad. Once drain function automatically stops, open chamber door and one to two inches of water remains in the chamber sump.
  - c. Select PUMP/DRIVE function and press **CYCLE/START** touch pad. During pump/drive function, check for proper operation of recirculation pump and carriage drive system; water should spray from the carriage and header spray jets as the carriage assembly moves back and forth.
  - d. Exit manual control mode by pressing **STOP/RESET** touch pad.
- 9. Select any pre-programmed cycle and press **CYCLE/START** touch pad. Run one complete cycle and check mechanical operation of washer.
  - 10. Check operation of each emergency safety cable. Actuate the traveller drive system in the manual control mode. Pull on emergency cable by reaching cable from outside of the washer. Verify all washer operations immediately stop. Press **ALARM REPLY** touch pad.
  - 11. Run several cycles, testing all the available options. Ensure washer functions properly and is leak-free.

*NOTE: Operational checklist must be completed prior to unit operation by the customer.*

Complete the following checklist to assure washer is correctly operating:

- ☐ Chamber sump steam coil functioning properly.
- ☐ Detergent tank filling to required level.
- ☐ Detergent tank steam coil functioning properly.
- ☐ Reusable-throwaway detergent system functioning properly.
- ☐ Spray jets aimed correctly.
- ☐ Pre-wash phase functions as programmed during entire specified time period.
- ☐ Alkaline wash phase functions as programmed during entire specified time period.
- ☐ Optional acid wash phase functions as programmed during entire specified time period.
- ☐ Optional acid soak timer functions properly.
- ☐ Rinse phase(s) functions as programmed during entire specified time period.
- ☐ Final rinse phase functions as programmed during entire specified time period.
- ☐ Carriage drive system functioning properly during all cycles.
- ☐ Each cycle is functioning as specified by customer order.
- ☐ Cabinet joints are completely sealed, no leaks. (For verification, run machine for 1/2 hour.)
- ☐ Door(s) easily opens from inside of chamber.
- ☐ Safety cables immediately stop washer operation when pulled.

Washer is now ready for customer operation.

## **Contact Information:**

### **Sales and Service:**

STERIS Corporation  
5960 Heisley Road  
Mentor, Ohio 44060  
Tel.: 440 354 2600  
Fax : 440 639 8199

### **Technical Assistance:**

STERIS Engineering Services  
2424 West 23rd Street  
Erie, PA 16506  
Tel.: 814 452 3100  
Fax: 814 870 8400

### **Manufacturer:**

Corporation STERIS Canada  
490 boul. Armand-Paris  
Beauport (Québec)  
Canada G1C 8A3  
Tel.: 418 664 1549  
Fax: 418 664 0188

### **Authorized EU Representative:**

STERIS Limited  
STERIS House  
Jays Close  
Viables  
Basingstoke  
Hampshire RG22 4AX  
United Kingdom  
Tel.: 44 1256 840400  
Fax: 44 1256 866502

**Web Site:** [www.steris.com](http://www.steris.com)